IN THE CLAIMS:

1. - 12. (canceled).

13. (new) An ion beam device comprising:

liquid metal ion beam irradiation means for irradiating a specific portion of a sample with a prescribed liquid metal ion beam so as to form a cross section; and

gaseous ion beam irradiation means for scanning a prescribed region of the cross section using a gaseous ion beam focused to a prescribed diameter and removing a damaged layer on the prescribed region.

14. (new) An ion beam device according to claim 13; wherein a size of a beam spot of the gaseous ion beam on the cross section is smaller than the size of the cross section.

15. (new) An ion beam device according to claim 13; wherein a size of a beam spot of the gaseous ion beam on the cross section is smaller than the size of the prescribed region.

16. (new) An ion beam device according to claim 13; wherein the gaseous ion beam irradiation means is configured in such a manner that the gaseous ion beam is incident in either a substantially perpendicular manner or at an incline with respect to the cross section.

17. (new) An ion beam device according to claim 13; wherein the gaseous ion beam is an inert gas ion beam.

18. (new) An ion beam device according to claim 13; further comprising in combination therewith an electron microscope for scanning the prescribed region using an electron beam and forming a transmitted electron image or secondary electron image for the prescribed region.

19. (new) An ion beam processing method comprising:

a first step of irradiating a specific portion of a sample with a prescribed liquid metal ion beam so as to form a cross section; and

a second step of scanning a prescribed region of the cross section using a gaseous ion beam focused to a prescribed diameter and removing a damaged layer on the prescribed region.

20. (new) An ion beam processing method according to claim 19; wherein the second step includes a step of changing the angle of incidence of the gaseous ion beam to the cross section so as to eliminate the damaged layer.

21. (new) An ion beam processing method according to claim 20; wherein the first step includes a step of changing an angle of irradiation of the prescribed liquid metal ion beam so as to form a cross section.

22. (new) An ion beam processing method according to claim 21; wherein a size of a beam spot of the gaseous ion beam on the cross section is smaller than the size of the cross section.

23. (new) An ion beam processing method according to claim 22; wherein a size of a beam spot of the gaseous ion beam on the cross section is smaller than the size of the prescribed region.

24. (new) An ion beam processing method according to claim 23; wherein the gaseous ion beam is an inert gas ion beam.

25. (new) An ion beam processing method according to claim 19; wherein the gaseous ion beam is an inert gas ion beam.

26. (new) An ion beam processing method according to claim 19; wherein a size of a beam spot of the gaseous ion beam on the cross section is smaller than the size of the prescribed region.

27. (new) An ion beam processing method according to claim 19; wherein a size of a beam spot of the gaseous ion beam on the cross section is smaller than the size of the cross section.

28. (new) An ion beam processing method according to claim 19; wherein the first step includes a step of changing an angle of irradiation of the prescribed liquid metal ion beam so as to form a cross section.